DOCUMENT RESUME

ED 156 309 PS 009 707

AUTHOR Iitaka, Kyoke; Yamada, Toshiko
TITLE Development of Nonverbal Behavior in the First Three Years of Life.
INSTITUTION Tokyo Gakugei Univ. (Japan). Research Inst. for the Education of Exceptional Children.
REPORT NO RRB-7
PUB DATE Feb 77
NOTE 28p.

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Developmental Stages; Imitation; *Infant Behavior; *Interaction Process Analysis; Longitudinal Studies; Mothers; *Nonverbal Communication; *Parent Child Relationship; Play; Research; *Speech Communication; Video Tape Recordings

ABSTRACT

This longitudinal study of the development of nonverbal behavior in the first 3 years of a child's life focuses on four factors: the relation between physical and vocal interaction between the child and his mother, observed cues which can be used to interpret the child's communicative intent at different age levels, frequency of occurrence and possible communicative purpose of pointing behavior, and the developmental pattern in imitative behavior. The subject, an 11-month-old boy, was observed with his mother in a free play situation in weekly 30-minute sessions over 10 consecutive weeks at approximately 1, 2 and 3 years of age. Videotape recordings and checklists of six behavior categories (requesting, reporting, responding, imitative, manipulative, and explorative behaviors) were subsequently analyzed for two of the ten sessions at each age level. Results indicated that (1) in mother-child interaction, physical interaction predominated over vocal interaction at age 1, while verbal communication predominated at ages 2 and 3; (2) observers relied on auditory information in interpreting the communicative intent associated with physical actions at ages 2 and 3; (3) pointing behavior occurred most frequently at age 2, and was interpreted to mean "request" at age 1, and "report" at ages 2 and 3; and (4) imitative behavior exhibited qualitative change over the 3 years, gradually shifting from immediate imitation to deferred imitation. (CM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

RIEEC

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED156309

RESEARCH BULLETIN

Working Paper Series

PS 009707

the Research Institute for the Education of Exceptional Children

Tokyo Gakugei University
Koganei, Tokyo
Japan

Development of Nonverbal Behavior in the First Three Years of Life

Kyoke Iitaka and Toshiko Yamada

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Shuji Izawa

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

RRB-7
February 1977

1. INTRODUCTION

Recently, there has been an increase of interest on nonverbal behavior in psychology, linguistics, and speech pathology. Studies of nonverbal behavior have traditionally been on the dynamics of adult speakers, or on the clinical analysis of psychotic patients (Duncan, 1969). There had hardly been any study focusing upon the nonverbal behavior of infants and young children.

Of course, nonverbal behavior should not be restricted to the field of communication. Since the 1920's, Guillaume (1926) and Piaget (1945) have made careful observation about development of young children and noted the importance of play and imitation in symbol formation, i.e. language development.

More recently, the methodology of human ethology has been adopted to compare the behavioral patterns of monkeys with those of humans in order to clarify the formation and development of human behavior (Hinde, 1972). At the same time more detailed analysis of human behavior has been attempted by some researchers. McGrew (1972) observed nursery school children and made up a detailed list including facial expression. He attempted to describe in this way all possible elements of behavior in social situation. The classification reliability in agreesive behavior was reported to be 84 %. A similar study was made by Kanno (1975) in Japan.

By examining human communication, Smith (1974) pointed out that a certain message tended to be expressed by a certain behavior. For an example, someone trying to run away, might avoid the other person, get ready to run, or actually run away. Smith states that mode of communication

has a close relationship with vocal utterances in verbal communication. Brannigan and Humphries (1972) classified human nonverbal behavior into 136 detailed items, such as movements of mouth, eyes, head, hands, arms, legs, trunk, and other parts of the body.Condon (1974) observed that a new born infant synchronized his body in response to the speech of adults. Kendon (1974) reports a similar observation in adults that the speakers and listeners synchronized their bodily motions in communicative situations.

In regard to objectively measuring bodily movement, Frey and von Cranach (1973) examined at intervals of 2.5 second each part of the body (head, turnk, right hand, left hand, right leg, and left leg). They found that head, turnk, and right leg are systematically related with emotional stress.

In the field of linguistics, a distinction was made by Trager (1958) between paralanguage and language. The vocal qualities and vocalization are included in the former. In classifying bodily gestures, von Raffler-Engel (1974) suggested the following five items as body movement: instinctive gesture, semiotic gesture, paralinguistic gesture, and descriptive gesture.

Several attempts have been made at studies of speech pathology and those relating to the communication of handicapped children. Nishimura (1970) classified the behavior of the severely mentally retarded into five categories: movement, impulsive action, voluntary action, behavior, and conduct. This classification is interesting but may require exact definition. Sugawara and others (1975) attempted to classify the

communicative behavior of the young children with impaired hearing. The expressive behavior can be pointing behavior, referential behavior, gesture, facial expression, imitation, vocalization, and actual handing of an object to other person. Sugawara and others studied the child's behavior from the following points of view: (1) understanding of the situation, (2) communicative purpose, (3) message, and (4) media of communication. Their attempt in analyzing the communicative behavior of the children with impaired hearing is more detailed. Since those children cannot speak intelligibly, the interpretation of the communicative purpose of the child's act depends on adults. Thus, the objectivity in their interpretation becomes quite an important task.

In a pilot study we found that the interpretation of the child's non-verbal behavior depends a great deal on the observers. When a child approached an adult, this was usually considered to mean "spontaneous contact" which could be either "request," "report" or some other contact. When the child hands something over to an adult, it could mean "response" or "request," asking the adult to do something. Before we could find some specific behavior in some communicative acts, it was necessary to find out how objectively one could determine the communicative act of a child. For that problem of judgment, auditory information seemed to play a rather important role.

Murai (1976) reported that there was a lack of pointing behavior in children with delayed language. Lack of pointing may mean two things. At first, it can be a lack of the communicative skill. Secondly, it might indicate a delay in cognitive development. In order that a child

can point to something, he must recognize himself and some other person or object. In other word, a certain cognitive readiness must take place before he can point. The emergence of the pointing and other expressive gestures may indicate that the child is beginning to form inner language.

Werner (1963) has stressed the importance of pointing and imitation in symbol formation. Usually, the pointing and other gestures are restricted by the environment. The imitative behavior, on the other hand, does not always require external stimuli. The imitative behavior might be more advanced form of symbolic behavior than pointing. Since there have been quite thorough surveys on the matter of imitation by Bloom (1974), Reese (1975), and Whitehurste (1975), a review of imitation will not be made here.

In the present study. we will aim to answer the following questions:

1) How does a child develop communication through nonverbal and verbal means in early childhood?
2) How do adults interpret the communicative intention of a child? To what extent can they understand the child's intention by observing his actions? To what extent does auditory information influence the observers' judgment?
3) In early childhood, how does pointing behavior first appear? How do adults interpret pointing behavior in communicative situations?
4) How does imitative behavior in a child develop in the first three years?

These questions deal with wider aspects of nonverbal development.

2. METHOD

a) Observation

For the purposes of this study a boy and his mother were observed in free play for 30 minutes over period of ten consequtive weeks at three different ages. The first 10 week period was from 11 month to 13 month when the child was just beginning to use his "first word." The second and third 10 week observation periods were at intervals of one year, the second period being from the 23rd to the 25th month and the third from the 35th to 37th month.

In a play room measuring 20 feet by 22 feet, the child was allowed to play freely with a toy car, picture books, several musical instruments (a drum, a small bell, castanets, a tambourine), toy pegs, a doll, a big rocking horse, and so on. A big blackboard was also provided on one side.

A zoom lens video camera and another video camera were placed at two corners of the room. These cameras were remote controlled so that the child's play activities were videotaped from the adjoining observational room. Two trained observers noted the instances of occurrence of defined child-mother interactions at ten second intervals through one-way mirror. The 10 second time signal tape was played in the observation room and simultaneously recorded into the video and magnetic tape recordings. The observational checklist used is shown Figure 1 and 2. The checklist shown in Figure 1 was used in the previous study (Iitaka, 1974).

b) Analysis

Two of the ten observational sessions at each age level were choses for detailed analysis, usually the fifth and tenth sessions. The total of

six video tapes thus chosen had a digital timer copied onto them so that the play activities were shown together with an interval.

In order to examine the effect of auditory information upon tasks of judgment, the observers were first shown the video tapes with the sound turned off and then, again with the sound on. Two observers separately noted and recorded the child's movements every ten seconds.

The observers noted the appearance of nonverbal behavior by using the behavior analysis checklist shown in Figure 3. The list for behavior analysis was divided into two parts. The first contained the following categories: spontaneous behavior such as (a) request and (b) report, responding behavior, imitative behavior, activities such as (a) manipulative behavior and (b) exploring behavior. The second part describes the corresponding movements: position, lower extremities, upper extremities, direction of face.

Since the existence of pointing and imitative behavior is said to be of some clinical significance, these two types of behavior were noted separately in addition to the results analyzed by the checklist shown in Figure 3. Pointing was defined as an action which refers to some object or person by using a hand. No distinction was made as to whether pointing occurred spontaneously or as a response.

3. RESULTS

Figure 4, 5, 6 shows the changes in patterns of vocal and physical interaction over the first three years. In the first period, at the age of about one year, the seventh session physical expression was predominant

over vocal expression until about when the "first word" seemed to appear. The vocal interaction occurred to a greater extent than physical. Unfortunately, at about this period the subject had measles. The observation had to be postponed for a week between the seventh and eighth session. Thus, the previously described pattern was no longer seen after the illness. In the second period which was around his second year, the child tended to communicate more verbally than physically. The same pattern was also seen in the third period, which was around his third year. However, he often depended upon gestures to supplement his verbal skills when there were not adequate for the intended expression.

In interpreting the child's nonverbal behavior, two observers disagreed more when the child was younger. Not until the child was three years old, did his behavior patterns become always predictable. It is interesting to note that the effect of the absence of auditory information upon behavior analysis judgment was different at each age level. These results are summarised in Table 1, 2 and 3.

The degree of agreement between the two observers in the behavioral judgments of video tape recordings with and without the auditory information is shown in Table 1. The reliability improves as the child becomes older. However, throughout all three periods, the observers agreed more when there was no auditory information. The task for the judges was to classify child's behavior into first six categories as in Figure 3. Thus, it could have been a simpler task to only use the visual cues.

Table 2 shows the level of agreement within the observers. As it was already pointed out, the level of agreement between the two observers in-

creases with the child's age. The presence of auditory information does not seem to result in an improvement of reliability at the one year level but certainly has some effect at the second and third year level. Especially at the second year level, agreement between the judges was improved by the aid of auditory information. Table 2 illustrates clearly the tendency stated above. At the second year level, the judges were more influenced by the presence of auditory information than at the other age levels.

At the one year level, the child was just beginning to utter some words. In trying to express what he intends, his action was more effective than his budding verbal skill. In contrast, at the second year level, the child was just beginning to speak two word sentences. He was trying to express himself more verbally. Thus it was easier to judge his communicative intention while listening as well as watching. At the third year level, the child's verbal skills more developed, but at the same time, he has begun to use more varied and imaginative actions in the given free play situation. Thus his behavior was easier to judge even without being able to hear what he said.

In noting the development of nonverbal behavior, we have focussed our attention on pointing and imitation.

a) Pointing Behavior

It was at two year level that pointing was most frequently observed. The total occurrences of pointing were 18 (first year), 48 (second year), and 19 (third year).

Two judges then examined each situation where pointing was used in order to interpret its communicative meaning. Table 3 shows the difference

between the two observers in interpreting the pointing behavior seen in the first, second, and third year level. At the one year level, when the child's speech is hardly intelligible, his pointing was most frequently understood as "request." (44%) At the same time, there were equally big proportion of pointing which could not be interpreted. At the second year level, when the child started to use two word sentences, his pointing behavior was more readily classified into "request" (19%), "report" (58%), and "others" (6%). There were still some cases of pointing (17%) whose communicative purposes were "unknown". At the third year level, the child's pointing was interpreted to represent greater communicative purposes: namely, "request" (16%), "report" (58%), "response" (11%), "others" (5%), and "unknown" (11%). It is interesting to note that the types of communicative intention of pointing become more varied as the child becomes older.

b) Imitative Behavior

It was decided that two samples at each age level were not enough to observe developmental pattern of imitative behaviors. For this purposes, all ten recordings at each age level were analyzed.

Imitative behavior was considered to have occurred when both observers agreed on its appearance. At first imitative behavior was defined as behavior which reenacted what was ..eard or seen without insisting that the act was an exact copy of the stimulus. Since the situation was a semi-controlled free play, no planned stimulus was provided. Throughout spontaneous play and interaction, these imitative behaviors occurred.

In examining the imitative behaviors thus observed, we noted some qualitative differences among them. The classification in Table 5 was

eventually evolved to show the developmental pattern of imitative behavior.

Figure 7 and Table 6 shows the occurrence of imitative behavior under each category. The occurrence of immediate imitation (Category A) is most frequent in the first year and then tapered off. On the other hand, deferred imitation (Categories B and C) appeared more after the two year level. Within deferred imitation, those with present stimulus (Category B) occurred more at first and gradually shifted to those without recognizable stimulus (Category C) (Yamada, et al. 1975). Table shows some examples of imitative behavior observed in this study.

4. DISCUSSION

In a child with normal hearing, there seems to be a turning point in early development where the verbal interaction pattern dominates over the physical one. It is interesting to note that the "first word" appears at about this period. Even after the child becomes verbally oriented, his interaction patterns continue to show that physical means are still a very substantial part of his total communication at both the second and third year levels. In another study, we had noted that 4 year-olds in free play also make substantial use of physical means of communication (Iitaka, et al. 1973).

Then how does an adult interpret a child's gestures and other nonverbal communicative expressions? How much do we depend upon what we hear in interpreting what the child is trying to express through nonverbal means?

At the one year level when the child's speech is hardly intelligible, we seem to interpret his expression largely through his gestures and contex-

tual cues. However, this task of interpretation is quite difficult even for his mother, who is Observer A. Her intra-observer reliability is no better than that of another person, Observer B. At the two year level, what we can hear seems to have considerable influence in our interpretation of what we see. At this stage the child is starting to use two word sentences and is getting to be quite verbal in his play. At the three year level, the child has more less mastered most of the verbal skills in his language. He displays [and obviously enjoys] a great deal of imaginative action in his play. At this stage, his behavior becomes easier to interpret for both observers.

In the early stage of communication, a child begins to use pointing. In deaf children, pointing is observed about the same time as in children with normal hearing. In our present analysis, the child uses pointing throughou all three age levels but most frequently at the two year level. The two year level is the stage when the child is learning to express himself more verbally but is quite inadequate in his expression. Thus he compensates what he can not say in words by pointing. These pointing were interpreted as mostly "request" in early stage. As the child grows older, the pointing behaviors were interpreted to mean not only "request" but "report" and "response."

As to the appearance of imitative behavior, we can see a developmental shift in the child in expressing himself first through sense-dominated means (immediate imitation) to mediating process (deferred imitation) (Hebb, 1966). This shift seems to indicate the growth of symbolic behavior or inner language in a child. This pattern of development was observed

by Guillaume (1926), Piaget (1945), and more recently by Bloom (1974).

Recently, imitation has been the subject of much controversy by behavior modification therapists. It is not the purpose of this paper to go into a lengthy argument on this matter. However, it should be pointed out that behavior modification techniques over-emphasize overt behavior and overlook the symbolic meaning of imitative acts.

Since the results of this study are on one child in the first three years of life, we are now conducting two studies. The first is on four normal children who are seen bi-monthly from the second month up to three years. The second is on 24 infants who are now being observed monthly up to two years of age. We hope to be able to say more when these studies are completed.

SUMMARY

A longitudinal observation was made to study the development of non-verbal behavior in a child from eleven month to 37 month of age. The study had four aims. The first was to see the relation between physical and vocal interaction between child and mother. The second was to find some cues by which the observers make judgment about the child's behavior at different age levels. The third was to see the frequency of occurrence of pointing behavior in the first three years and also to decide the possible communicative purpose for each pointing behavior. The fourth was to observe the developmental pattern in imitative behavior in the first three years.

For the purposes of this study an eleven month old boy and his mother

were observed in a 30 minutes free play for consequtive ten weeks at three different periods. These periods were as follows: the first from the 11th to the 13th month, the second from the 23rd to the 25th month, and the third from the 35th to the 37th month.

Two observers noted the instances of occurrence of the defined child-mother interaction at intervals of ten second. The videotape recording and magnetic recording were made simultaneously for subsequent analysis. Two out of ten observational sessions were chosen at each age level for detailed analysis, usually the fifth and tenth sessions. The total of six videotapes thus chosen, were played back while two observers noted the occurrence of nonverbal behavior by using the checklist. The list for behavior analysis contained the following categories: (1) requesting behavior, (2) reporting behavior, (3) responding behavior, (4) imitative behavior, (5) manipulative behavior, and (6) explorative behavior. In order to examine the effect of auditory information upon the judgmental tasks of nonverbal behavior, the observers first saw the video recordings with the sound turned off and then with the sound on. The difference in the results of behavioral category judgment was obtained. Next, each instance of pointing behavior was examined as to its possible communicative intention. Then the imitative behaviors were noted and analyzed. For the imitative behaviors all ten of the video tapes at each age level were used, not just two.

The checklist results regarding the interaction of the child and the mother showed that in the first period (around one year old), physical interaction was predominant over vocal interaction until the time when his

"first word" seemed to appear. Then vocal interaction occurred more than physical interaction. In the second and third periods (around two years old and three years old), the child tended to communicate more verbally. However, he still depended on gestures to supplement his verbal skills when these were not adequate for the intended expression.

In interpreting the child's message expressed by gestures and other nonverbal means, two observers disagreed more when judging behavior seen in the first or in the second year. When the child becomes nearly three years old, his behavior patterns became more predictable. However, the lack of auditory information had a different effect at each age level. In the first year, the child was just beginning to speak, but was more active in physical interaction. Therefore, the absence of auditory information did not make much differnce in trying to interpret his behavior. In either case, the judgmental tasks were difficult. In the second year, the child's verbalization almost always accompanied with physical actions. The auditory information often influenced the observers in making the judgment. In the third year, the child spoke more than he expressed himself in gestures. Whenever he used gestures, it was to supplement his speech. Thus his gestures and behavior were more predictable.

The pointing behavior was most frequently seen at the two year level. However, it occurred to some extent both at the first and the third year level. Two observers did not always agree what might have been intended by these pointings. Most often the pointing was interpreted to mean "request" (44%) in the first year, "report" (58%) in the second year, and again "report" (58%) in the third year. The occurrence of unclassified

pointing behavior decreased as the child became older.

Imitative behavior seemed to show a qualitative change over the three years. There was a gradual shift from immediate imitation to deferred imitation. Within the deferred imitation, the act is elicited at first with a stimulus present and then later without any recognizable stimulus.

Some implication of these findings was discussed and further study was suggested.

REFERENCES

1. Bloom,L. 1974 Imitation in language development. If, when, and why. Cognitive Psychology. 6, 380-420.

2. Brannigan,C.R. & Humphries,D.A. 1972 Human nonverbal behavior, a means of communication. In Hones,N.B. (ed.) Ethological Studies of Child Behavior. Cambridge Univ. Press.

3. Condon,W.S. & Sander,L.W. 1974 Neonate movement is synchronized with adult speech: interactional participation and language acquistion. Science. 11, 99-101.

4. Duncan,S.Jr. 1969 Nonverbal communication. Psychological Bulletin. 72, 118-137.

5. Frey,S. & von Cranach,M. 1973 A method for the assessment of body movement variability. In von Cranach,M. & I. Vine (eds.) European Monographs in Social Psychology, No.4, "Social Communication and Movement Studies of Interaction and Expression in Man and Chimpanzee." Academic Press: New York.

6. Guillaume,P. 1926 L'Imitation Chez L'Enfant. 1968 Halper,E.P (tr.) Imitation in Children. Univ. of Chicago Press.

7. Hebb,D.O. 1966 A Textbook of Psychology. (2nd Edition) Saunders,Co.: New York.

8. Hinde,R.A. 1972 Nonverbal Communication. Cambridge Univ. Press.

9. Iitaka, A.K. Oogawara, M. & Yamaki, N. 1973 A study on communicative abilities of mentally retarded children. Nihon Onsei Gengo Igakukai (The Japan Society of Logopedics and Phoniatrics) 14, 51. (in Japanese)

10. Iitaka,A.K. 1974 A study in early speech development. Research Bulletin. No. 4.

11. Kanno,J. & Umaoka,S. 1975 Yooji koodo no hikakukoodoogakuteki bunseki no kokoromi (An attempt on the ethological analysis of children's behavior). Nihon Shinri Gakkai dai 39 kai Happyo Ronbunshu (a paper presented at the 39th Meeting of the Japanese Association of Psychology). 318. (in Japanese)

12. Kendon,A. 1974 Movement coordination in social interaction: some examples described. In Weitz,S. (ed.) Nonverbal Communication. Oxford Univ. Press.

13. McGrew,W.C. 1972 Elements of behavior. In An Ethological Study of Children's Behavior. Academic Press: New York.

14. Murai,J. 1976 Kotoba no kakutoku no mekanizumu (A mechanism of language acquisition) In Murai,J. et al. (eds.) Kotoba no Hattatsu to sono Shogai (Language Development and its Disorders) Daiichi Hooki. (in Japanese)

15. Nishimura,S. 1970 A developmental study on the behaviors of the profoundly retarded. Tokushu Kyoikugaku Kenkyu (Japanese Journal of Special Education). 7, 13-27. (in Japanese)

16. Piaget,J. 1945 La Formation du Symbole Chez L'Enfant. 1970 Ootomo, S. (tr.) Mohoo no Shinrigaku (Psychology of Imitation) Reimei Shobo. (in Japanese)

17. Reese,N.S. 1975 Imitation and language development: issues and clinical implications. Journal of Speech and Hearing Disorders. 40, 339-350.

18. Smith,W.J. 1974 Displays and messages in intraspecific communication. In Weitz,S. (ed.) Nonverbal Communication. Oxford Univ. Press.

19. Sugawara,K., Im[illegible],H. & Iwaki,K. 1975 Chokaku shogai yoji no kooshin kodo no bunseki (An analysis on communicative behavior of hearing-handicapped children) Kokurits Tokushukyoiku Soogo Kenkyujyo Kenkyu Kiyo. 2, 93-107. (in Japanese)

20. Trager,G.L. 1958 Paralanguage: a first approximation. Studies in Linguistics. 13, 1-12.

21. von Raffler-Engel,W. 1974 The acquisition of kinesics. a paper presented at The Twenty-Seventh Annual Kentucky Foreign Language Conference.

22. Werner,H. & Kaplan,B. 1963 Symbol Formation. John Wiley & Sons: New York.

23. Whitehurst,G.J. & Vasta,R. 1975 Is language acquired through imitation? Journal of Psycholinguistic Research. 4, 37-59.

24. Yamada,T & Iitaka,A.K. 1975 Nyuyoji no moho kodo no hattatsu (Development of imitative behavior in a young child) Nihon Kyoikushinri Gakkai dai 17 kai Happyo Ronbunshu (a paper presented at the 17th Meeting of the Japanese Association of Educational Psychology) 152-153. (in Japanese)

Name of Observer_____ Date of Observation_____

Time		Physical			Vocal		No Response	Playing Alone		Notes
		Spontaneous Approach	Spontaneous Contact	Physical Interaction	Spontaneous Contact	Vocal Interaction		Playing Behavior	Vocalization	
0	0									
	1									
	2									
	3									
	4									
	5									
1	0									
	1									
	2									
	3									
	4									
	5									

Figure 1. Checklist for infant-mother interaction in a free play (for one year old level)

Name of Observer_____ Date of Observation_____

Time		Physical			Verbal			No Response	Notes
		Spontaneous Contact	Response	Physical Interaction	Spontaneous Contact	Response	Verbal Interaction		
0	0								
	1								
	2								
	3								
	4								
	5								
1	0								
	1								
	2								
	3								
	4								
	5								

Figure 2. Checklist for child-mother interaction in a free play (for two and three year old level)

Voice ON OFF Date of Observation_____

Time		Request	Report	Responding Behavior	Imitative Behavior	Manipulative Activities	Explorative Activities	Position	Lower Extremities	Upper Extremities	Notes
0	0										
	1										
	2										
	3										
	4										
	5										
1	0										
	1										
	2										
	3										
	4										
	5										

Figure 3. Checklist for nonverbal behavior analysis

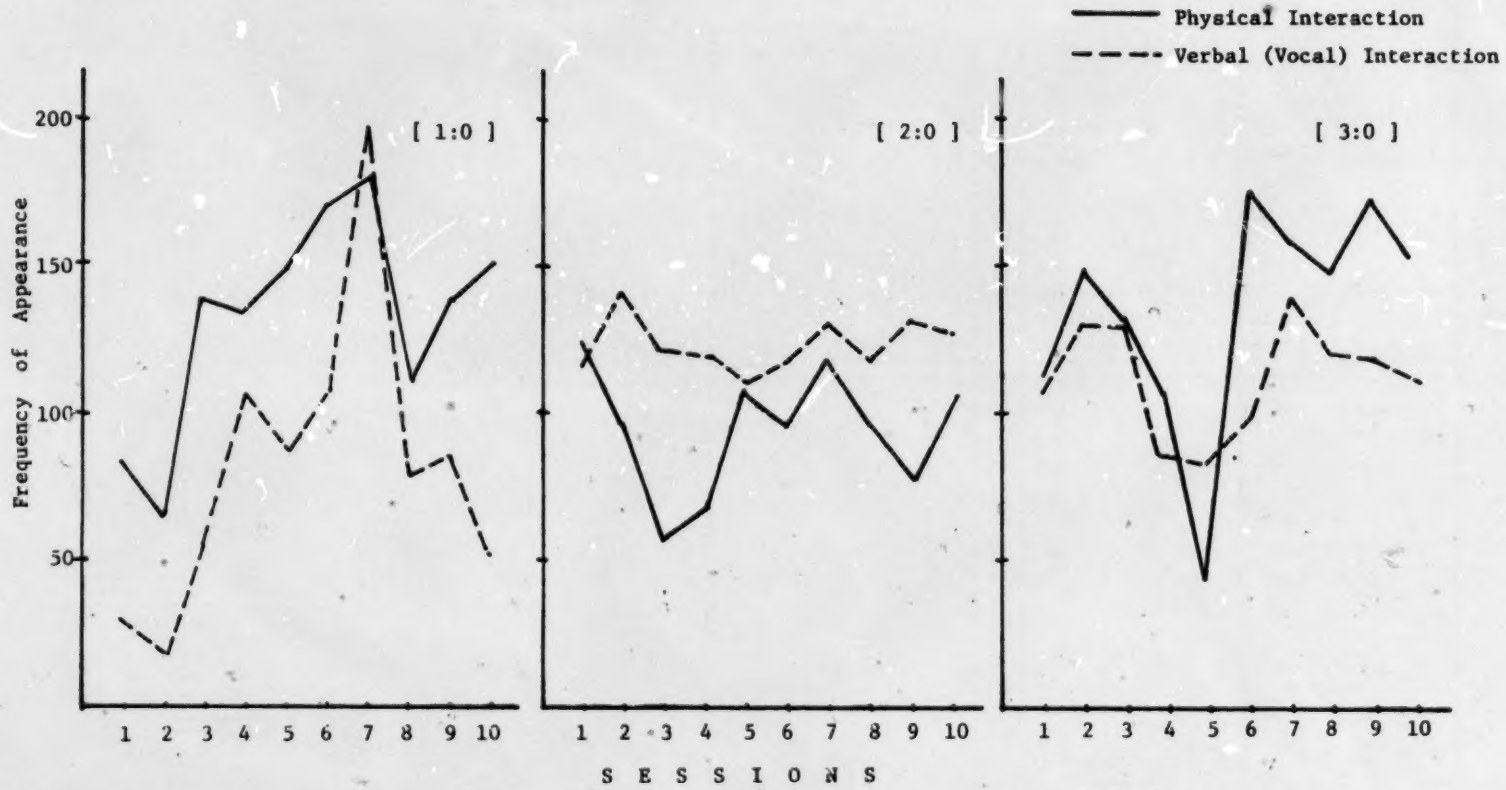


Figure 4. Frequency of physical and vocal interaction in 30 minute free play for 10 consecutive weeks (11 month to 14 month)

Figure 5. Frequency of physical and verbal interaction in 30 minute free play for 10 consecutive weeks (23 month to 25 month)

Figure 6. Frequency of physical and verbal interaction in 30 minute free play for 10 consecutive weeks (35 month to 38 month)

Auditory information C.A.	Present	Absent
1:0	39%	55%
2:0	47%	51%
3:0	74%	81%

Table 1. Inter-observer's reliability in the behavioral judgement of videotape recordings with and without auditory information.

	C.A.	Request	Report	Other Spontaneous Contact	Responding Behavior	Interaction	Imitative Behavior	Manipulation	Exploration	Total
Observer-A	1:0	4	0	0	0	0	0	0	0	4
	2:0	5	5	1	8	0	0	0	0	19
	3:0	0	0	0	0	0	1	4	0	5
Observer-B	1:0	1	0	1	0	1	0	0	0	3
	2:0	13	3	0	2	0	0	4	0	22
	3:0	0	0	0	1	0	1	0	0	2

Table 2. Difference in the behavioral judgment on videotaped recordings when auditory information was absent and when present

Ob. C.A. / Auditory information	Present		Absent	
	Observer-A	Observer-B	Observer-A	Observer-B
1:0	46%	60%	55%	68%
2:0	57%	74%	48%	59%
3:0	82%	89%	89%	84%

Table 3. Intra-observer's reliability in the behavioral judgment videotaped recordings when auditory information was present and when absent

C.A.	Request	Report	Other Spontaneous Contact	Responding Behavior	Unclassified	Total
1:0	8	0	7	0	3	18
	44%	0%	39%	0%	17%	
2:0	9	28	3	0	8	48
	19%	58%	6%	0%	17%	
3:0	3	11	1	2	2	19
	16%	58%	5%	11%	11%	

Table 4. Difference between two observers in interpreting the pointing behavior seen in the first three years

I. Immediate imitative behavior

a) Imitative vocalization (V)

This is the immediate and spontaneous vocalization of what the child heard.

b) Imitative gesture (G)

This denotes the immediate and spontaneous reproduction in gestures of what the child saw.

c) Imitative behavior (V + G)

This is the simultaneous occurrence of (a) and (b).

II. Deferred imitative behavior

A. The existing stimulus (toy, picture, sound, etc.) reminds a child of a past experience in which he used this object according to its proper function.

a) Imitative vocalization (V)

The spontaneous vocalization of what the child's auditory conception of the stimulus.

b) Imitative gesture (G)

The spontaneous reproduction in gestures of the child's visual conception of the stimulus.

c) Imitative behavior (V + G)

The spontaneous gesture with vocalization of what the stimulus had been.

B. The existing stimulus reminded a child of some experience in which he tried to express some symbolic* figure evolved out of the original stimulus.

a) Imitative vocalization (V)

b) Imitative gesture (G)

c) Imitative behavior (V + G)

* In this study the word [symbolic] is used in a much more wider sense than the strictly abstract concept.

C. Where there is no recognizable stimulus.

a) Imitative vocalization (V)

The child tries to put into words his impression of the particular past experience.

b) Imitative gestue (G)

The child tries to express in gestures his impression of the particular past experience.

c) Imitative behavior (V + G)

This is the simultaneous occurrence of (a) and (b).

Table 5. Classification of imitative behavior

One Year Level

I. Immediate Imitation

a) S: "ball" - R: /bo/ (V)

b) S: making sounds with castanets - R: making sounds with castanets (G)

c) S: saying "pon" while throwing a ball - R: imitating the sound and the act (V + G)

II. Deferred Imitation

A. Stimulus present - imitating its use as originally intended

b) S: a toy cup - R: pretending to drink (G)

c) S: a mirror - R: playing "peek-a-boo" while saying /ba/ (V + G)

Two Year Level

II. Deferred Imitation

A. Stimulus present - imitating its use as originally intended

c) S: a toy telephone - R: pretending to telephone to his mother (V + G)

B. Stimulus present - imitating with it as if it were something else

c) S: a toy piano - R: holding it like a gun and pretending to shoot, saying "bang, bang." (V + G)

C. No stimulus present

c) R: saying that he is a hero in a television program and pretending to fight with a monster (V + G)

Third Year Level

II. Deferred Imitation

A. Stimulus present - imitating its use as originally intended

c) S: a door drawn in the picture book -
R: pretending to knock at the door, saying "knock, knock." (V + G)

B. Stimulus present - imitating with it as if it were something else

a) S: a picture of animal family
R: pretending that the animals are the members of his own family and giving them the corresponding names (V)

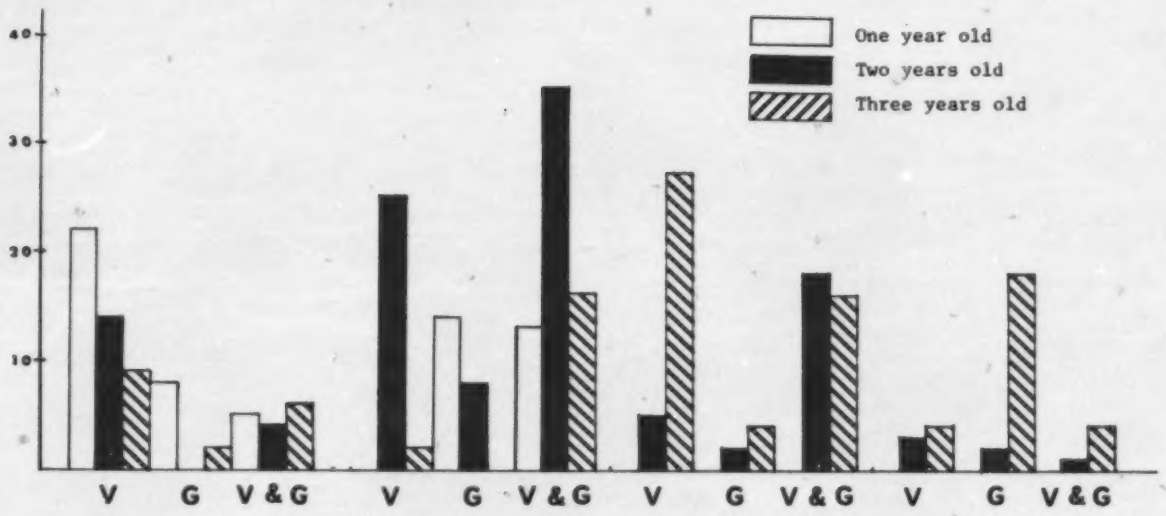
c) S: a toy peg - R: holding it as if it were a sword and pretending to fight with monsters (V + G)

C. No stimulus present

b) R: asking his mother to draw a roof, showing its shape by hands (G)

c) R: while saying he is a hero in a television program, he pretends to fight with a monster (V + G)

Table 7. Examples of imitative behavior observed in the first three years



Imitative Verbalization (Vocalization) (V)
Imitative Gesture (G)
Imitative Behavior (V & G)

Figure 7. Occurrence of imitative behavior in the first three years.

	I			II									Total
				(A)			(B)			(C)			
Age	V	G	B	V	G	B	V	G	B	V	G	B	
1:0	22	8	5	0	14	13	0	0	0	0	0	0	62
2:0	14	0	4	25	8	35	5	2	18	3	2	1	109
3:0	9	2	6	2	0	16	27	4	16	4	18	4	108

Table 6. Frequency and types of imitative behavior observed in the first three years